

Claims

1. A stripping composition for removing a photoresist including novolak, the stripping composition comprising:

5 an acetic acid; and

an ozone gas included in the acetic acid as a bubble form.

2. The stripping composition of claim 1, wherein a pH of the stripping composition is about 1.6 to about 5.0.

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3. The stripping composition of claim 1, wherein a concentration of the ozone gas included in the acetic acid is about 80,000 to about 90,000ppm.

4. A method of forming a pattern, the method comprising:

15 forming a photoresist pattern including novolak on a layer formed on a substrate;

etching the layer using the photoresist pattern using as a mask to form a pattern on the substrate; and

20 removing the photoresist pattern using a stripping composition including an acetic acid and an ozone gas included in the acetic acid as a bubble form.

5. The method of claim 4, wherein the stripping composition is prepared by bubbling the ozone gas in the acetic acid.

25 6. The method of claim 5, wherein a concentration of the ozone gas included in the acetic acid is about 80,000 to about 90,000ppm.

7. The method of claim 4, wherein the removing the photoresist pattern further comprises:

spraying the stripping composition onto the photoresist pattern to wet the photoresist pattern; and

5 rinsing the photoresist pattern.

8. The method of claim 7, wherein the photoresist pattern is rinsed using water.

10 9. The method of claim 7, wherein the spraying the stripping composition further comprises:

moving the substrate in a first direction during spraying the stripping composition onto the photoresist pattern; and

15 moving the substrate in a second direction opposed to the first direction during spraying the stripping composition onto the photoresist pattern.

10. The method of claim 4, wherein a pH of the stripping composition is about 1.6 to about 5.

20 11. The method of claim 4, wherein the layer comprises a gate layer having a first gate wiring layer and a second gate wiring layer,

and wherein, the method further comprises:

etching the second gate wiring layer using the photoresist pattern as a mask to form a second gate wiring layer pattern;

25 removing the photoresist pattern using the stripping composition; and

etching the first gate wiring layer to form a first gate wiring layer pattern.

12. The method of claim 11, wherein the gate layer comprises a Cr layer and an Al layer.

13. The method of claim 11, wherein the photoresist pattern is removed 5 using the stripping composition after etching the first and second gate wiring layers using an etching gas.

14. The method of claim 13, wherein the etching gas comprises a chlorine gas.

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15. The method of claim 11, wherein the photoresist pattern is removed by using the striping composition after a contact hole is formed according to etching the first and second gate wiring layers.

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16. A method of manufacturing a TFT substrate for an LCD device, the method comprising:

forming a first gate wiring layer and a second gate wiring layer on a substrate;

forming a first photoresist pattern including novolak;

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etching the second gate wiring layer using the first photoresist pattern as an etching mask;

removing the first photoresist pattern using a stripping composition including an acetic acid and an ozone gas included in the acetic acid as a bubble form;

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etching the first gate wiring layer to form a gate pattern having a gate line, a gate pad and a gate electrode;

forming a gate insulation layer on the substrate having the gate pattern;

forming a semiconductor layer and a doped amorphous silicon layer on the

gate insulation layer;

forming a semiconductor layer pattern and an ohmic contact pattern by etching the semiconductor layer and the doped amorphous silicon layer;

5 forming a conductive material on the semiconductor layer pattern and on the ohmic contact pattern;

forming a data line, a source electrode and a drain electrode by etching the conductive material;

forming a passivation layer on the data line, the source electrode and the drain electrode;

10 forming a second photoresist pattern including novolak on the passivation layer;

etching the passivation layer to form a contact hole partially exposing the drain electrode;

15 removing the second photoresist pattern using a stripping composition including an acetic acid and an ozone gas included in the acetic acid as a bubble form; and

forming and etching transparent conductive material layer to form a pixel electrode.

20 17. A method of manufacturing a TFT substrate for an LCD apparatus, the method comprising:

forming a gate pattern having a gate line, a gate pad and a gate electrode on a substrate;

forming a gate insulation layer on the substrate having the gate pattern;

25 forming a semiconductor layer, an intermediate layer and a conductive layer on the gate insulation layer;

forming a photoresist film including novolak on the conductive layer;

exposing and developing the photoresist film to form a photoresist pattern having a first region formed in a channel region disposed between a source electrode and a drain electrode successively formed and a second region formed in a data wiring region successively formed, the first region having a thickness thinner than a thickness of the second region;

5 etching the conductive layer, the intermediate layer and the semiconductor layer using the photoresist pattern as an etching mask to form a semiconductor layer pattern in the channel region, and to form the semiconductor layer pattern, an intermediate layer pattern and a conductive layer pattern in the data wiring region so that a data line, the source electrode and the drain electrode are formed in the channel and the data wiring regions;

10 removing the photoresist pattern using a stripping composition including an acetic acid and an ozone gas included in the acetic acid as a bubble form;

15 forming a passivation layer on the data line, the source electrode and the drain electrode;

etching the passivation layer to form a contact hole partially exposing the drain electrode; and

forming and etching transparent conductive material layer to form a pixel electrode.

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18. A method of manufacturing a TFT substrate for an LCD apparatus, the method comprising:

forming a data wiring having a data line on a insulation substrate;

25 forming a red color filter, a green color filter and a blue color filter on the substrate;

forming a buffer layer covering the data wiring and the color filters;

forming a gate wiring layer on the buffer layer;

forming a photoresist pattern including novolak on the gate wiring layer;

etching the gate wiring layer using the photoresist pattern as an etching mask to form a gate wiring having a gate line and a gate electrode;

removing the photoresist pattern using a stripping composition including an acetic acid and an ozone gas included in the acetic acid as a bubble form;

5 forming a gate insulation layer to cover the gate wiring;

forming an ohmic contact layer pattern of an island shape and a semiconductor layer pattern on the gate insulation layer, and simultaneously forming a first contact hole through the gate insulation layer and the buffer layer to partially expose the data line;

10 forming a pixel wiring including a source and a drain electrodes separately formed on the ohmic contact layer pattern, and a pixel electrode connected to the drain electrode, the source and the drain electrodes substantially including identical material; and

15 removing an exposed portion of the ohmic contact layer pattern between the source electrode and the drain electrode to separate the ohmic contact layer pattern.